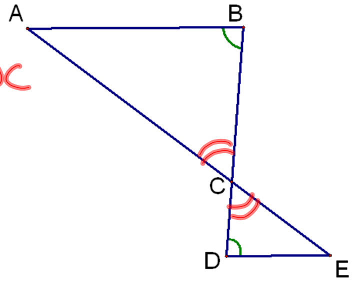
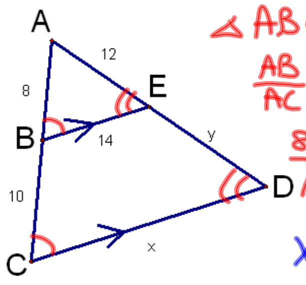
6-4 and 6-5 Prove Triangles Similar by AA~, SSS~, and SAS~

Postulate 22--Angle-Angle (AA~) Similarity Postulate--If 2 angles of 1 triangle are congruent to 2 angles of another triangle, then the 2 triangles are similar.

$\triangle ABC \sim \triangle EDC$
AA~



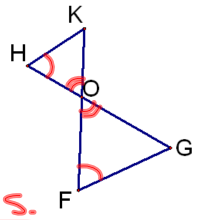


$\triangle ABE \sim \triangle ACD$

$\frac{AB}{AC} = \frac{BE}{CD} = \frac{AE}{AD}$

$\frac{8}{18} = \frac{14}{x} = \frac{12}{12+y}$

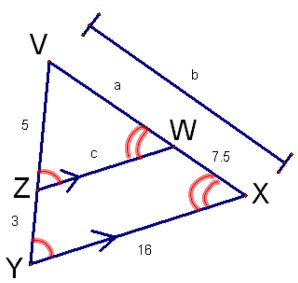
$x = 31.5$ $y = 15$



Given: $\angle H \cong \angle F$

Prove: $HK \cdot GO = FG \cdot KO$

S.	R
① ~	① Given
② $\angle HOK \cong \angle GOF$	② Vertical $\angle$s $\cong$
③ $\triangle HOK \sim \triangle FOG$	③ AA~
④ $\frac{HK}{FG} = \frac{KO}{GO}$	④ Corr. sides of $\sim\triangle$s are prop.
⑤ $HK \cdot GO = FG \cdot KO$	⑤ Cross Mult.



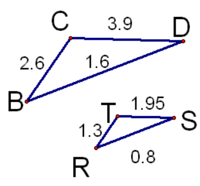
Theorem 6.2---SSS~ Theorem--If the corresponding side lengths of 2 triangles are proportional, then the triangles are similar.

sm med lg

$\frac{1.6}{.8} = \frac{2.6}{1.3} = \frac{3.9}{1.95}$

$2 = 2 = 2$ ✓

SSS~

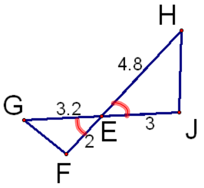


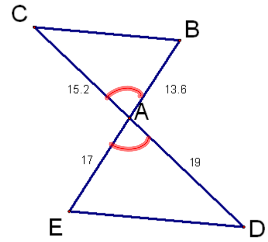
Theorem 6.3--<u>SAS~ Theorem</u>--If an angle of 1 triangle is congruent to an angle of a second triangle, and the lengths of the sides including these angles are proportional, then the triangles are similar.

$\frac{2}{3} \stackrel{?}{=} \frac{3.2}{4.8}$

SAS~

$\triangle GEF \sim \triangle HEJ$





Are the triangles similar?

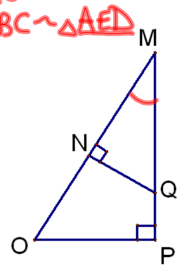
$\frac{13.6}{17} = \frac{15.2}{19}$ ✓

yes
SAS~
$\triangle ABC \sim \triangle AED$

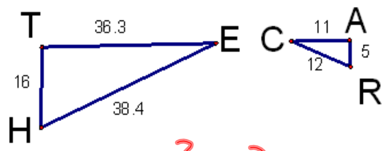
Are the triangles similar?

AA~

$\triangle MNQ \sim \triangle MPO$

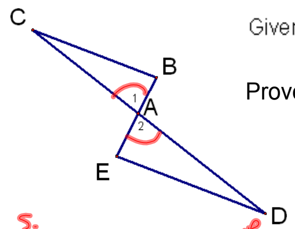


Are the triangles similar?



$\frac{5}{16} \stackrel{?}{=} \frac{11}{36.3} \stackrel{?}{=} \frac{12}{38.4}$

no



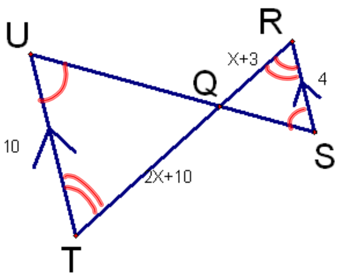
Given: $\frac{AC}{AD} = \frac{BA}{EA}$

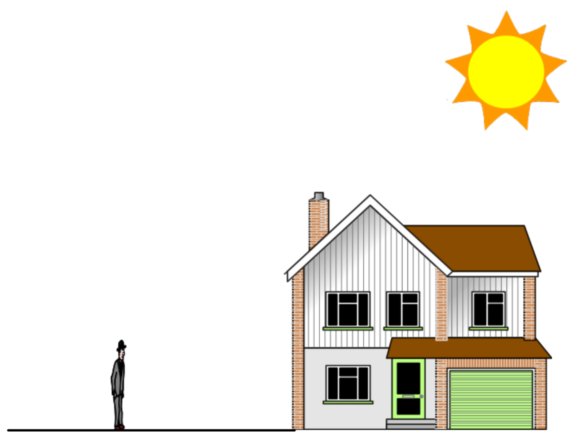
Prove: $\angle C \cong \angle D$

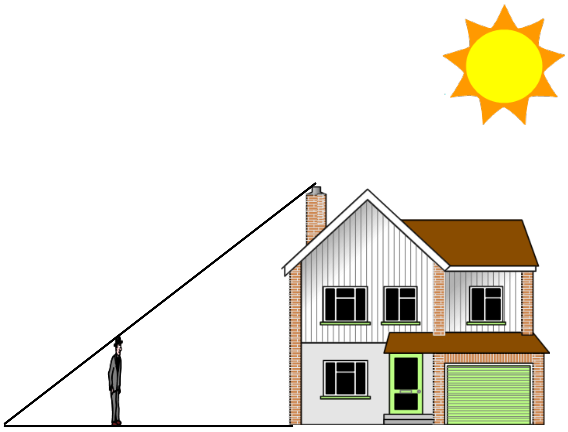
S.	R.
① $\frac{AC}{AD} = \frac{BA}{EA}$	① Given
② $\angle 1 \cong \angle 2$	② Vert $\angle$s $\cong$
③ $\triangle ABC \sim \triangle AED$	③ SAS~
④ $\angle C \cong \angle D$	④ Corr. $\angle$s of ~$\triangle$s are $\cong$

$\frac{10}{4} = \frac{2x+10}{x+3}$

$x = 5$

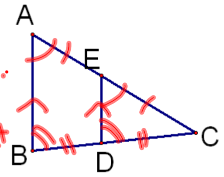






Given: $\overline{DE}$ is the midsegment of ΔABC
Prove: $\Delta CDE \sim \Delta CBA$

S.	R.
1 ~	1 Given
2 $\overline{DE} \parallel \overline{AB}$	2 Midsegment Thm
3 $\angle A \cong \angle CED$, $\angle B \cong \angle CDE$	3 Corr $\angle$s post.
4 $\Delta CDE \sim \Delta CBA$	4 AA~



HW
p384-385 #s 3-17, 21, 22, 25
p392-394 #s 5-8, 33